

York—6th, 7th, (13th to 17th, injured vegetation,) 18th, 23rd. *New Jersey*—11th, (13th, 14th, injured vegetation,) 16th. *Pennsylvania*—10th, 11th, 12th, (13th, 14th, 16th, injured vegetation,) 23rd, 29th, 31st. *Delaware*—(16th, injured vegetation,) 23rd. *Maryland*—4th, (13th, injured vegetation,) 15th and 23rd. *Virginia*—6th, 11th, (13th, 16th, injured vegetation.) *North Carolina*—5th, 6th, 10th, 11th, (16th, injured vegetation.) *Kentucky*—10th, 11th, 13th, 15th. *Ohio*—5th, 6th, 8th to 12th, (13th, 16th, injured vegetation.) *Indiana*—6th, 11th, 12th, (13th, injured vegetation,) 14th, 15th, 27th. *Illinois*—4th, 9th, 10th, (11th, 12th, 13th, injured vegetation.) *Michigan*—4th to 6th, 10th to 17th, 28th to 30th. *Wisconsin*—6th, 10th, 12th, (13th, injured vegetation,) 30th. *Minnesota*—3d, 4th, 10th to 13th. *Iowa*—3d to 5th, 10th, (11th, 12th, 13th, injured vegetation,) 17th, 27th. *Missouri*—3d, 4th, (10th, injured vegetation,) 15th. *Kansas*—4th, 10th, 14th. *Nebraska*—3d, 4th, (10th, injured vegetation,) 12th. *Dakota*—1st to 15th, 21st, 27th to 29th. *Wyoming*—3d, 8th, 10th. *Colorado*—8th, 10th. *Utah*—7th, 8th. *New Mexico*—3d, 4th, 18th.

*Ice* is reported to have formed as follows: *Dakota*, at Olivet, 9th,  $\frac{1}{4}$  in., 12th,  $\frac{3}{4}$  in.; Bismarck, 2d,  $\frac{1}{4}$  in. *Missouri*—10th. *Nebraska*—4th, 10th to 12th. *Iowa*—4th, 11th to 14th, 16th. *Wisconsin*—10th, 12th, 13th. *Michigan*—13th to 15th. *Indiana*—12th. *Ohio*—4th to 6th, 13th, 14th. *Pennsylvania*—12th, 13th, 14th, 16th. *Virginia*—16th. *New Jersey*—12th to 14th. *New York*—13th, 14th, 16th. *Connecticut*—12th to 16th. *Massachusetts*—13th, 14th. *Vermont*—12th, 15th. *New Hampshire*—13th.

## PRECIPITATION.

*In General*.—The general distribution of rain (and melted snow) for the month is shown on chart No. III. Fillmore City, Utah, and Kit Carson, Col., (Sun-set stations,) report 10.30 and 13.25 inches rain-fall, respectively; but these figures are probably incorrect. By reference to the table in the lower left-hand corner of the same chart it will be seen that the rain-fall for the month has been considerably above the normal in the Southwest, Lower Missouri valley, Eastern Gulf and Middle Atlantic States, and decidedly below normal in New England.

*Special Heavy Rains*.—2nd, Judsonia, Ark., 2.75 inches; Mt. Ida, Ark., (2nd, 3rd,) 3.35 in. 3rd, Brookhaven, Miss., 2.30 in. 5th, Wappinger's Falls, N. Y., (4th, 5th,) 2.30 in.; Ardenia, N. Y., (4th, 5th,) 2.11 in.; Wilmington, N. C., (4th, 5th,) 2.30 in.; Colebrook, Conn., (4th, 5th,) 2.30 in.; Mt. Washington, 2.87 in.; Dover Mines, Va., (4th, 5th,) 2.25 in.; Mt. Solon, Va., (4th, 5th,) 2.10 in. 8th, Point Pleasant, La., 2.06 in. 10th, Brackettville, (10th, 11th,) 3.59 in. 12th, Lawrence, Kan., (11th, 12th,) 2.05 in.; Wet Glaze, Mo., 2.00 in.; Austin, Tex., 2.80 in.; Castroville, 2.16 in.; Fredericksburg, 3.00 in. 14th, Fort Monroe, Va., 2.02 in.; Brackettville, 2.28 in.; Cape Henry, 2.27 in. 15th, Accotink, Va., (14th, 15th,) 2.00 in.; Cape Henry, (14th, 15th,) 3.02 in.; Independence, Kan., 2.08 in. 17th, New Orleans, 2.05 in.; Independence, Kan., (17th, 18th,) 2.20 in. 18th, Louisville, Ill., (18th, 19th,) 3.00 in.; Vicksburg, 2.14 in.; Corsicana, 2.35 in.; Kansas City, Mo., 2.00 in.; Wet Glaze, Mo., 2.30 in.; Fayette, Miss., (18th, 19th,) 2.50 in. 19th, Algiers, La., (19th, 20th,) 4.00 in.; New Orleans, 3.54 in.; Macon, Miss., (18th, 19th,) 2.25 in.; Deadwood, D. T., (18th, 19th,) 3.68 in. 20th, Fayetteville, N. C., 2.50 in. 21st, Goldsboro', N. C., 3.75 in.; Clarksville, Tex., (20th, 21st,) 6.50 in. 22nd, Dodge City, (21st, 22nd,) 3.30 in.; Fort Gibson, 2.52 in.; near Genoa, Neb., 2.30 in. Judsonia, Ark., (24th, 25th,) 2.25 in.; Independence, Kan., (22nd to 25th,) 4.12 in. 27th, Charleston, S. C., 3.48 in. 29th, Logan, Iowa, 2.50 in.; De Sota, Neb., 3.88 in.; Glenwood, Mills county, Iowa, 6.00 in. 30th, Hennepin, Ill., 2.90 in. 31st, Wood's Holl, (30th, 31st,) 3.53 in.; Brookhaven, N. Y., (30th, 31st,) 4.03 in.; Newport, 3.80 in.; Atlantic City, (30th, 31st,) 4.69 in.; Mystic, Conn., 2.00 in.; Lebanon, Mo., 1.44 in., (in 45 minutes;) Springfield, Mo., 3.25 in.

*Largest Monthly Rain-falls*.—At Glenwood, Iowa, 12.00 inches; Springfield, Mo., 11.75 in.; near Independence, Kan., 10.06 in.; Clarksville, Tex., 10.25 in.; Judsonia, Ark., 9.85 in.; Wet Glaze, Mo., 9.50 in.; Lebanon, Mo., 9.39 in.; Mt. Washington, 9.28 in.; Algiers, La., 8.90 in.; Henrietta, Tex., 8.33 in.; Deadwood, Dak., 7.80 in.; Fayetteville N. C. 7.60 in., and Goldsboro, N. C., 7.50 inches.

*Smallest Monthly Rain-falls*.—At Florence, Tucson, Camp Grant and Yuma, in Arizona, and Monterey and Santa Barbara, Cal., none; Visalia, Cal., 0.08 in.; San Francisco, 0.16 in.; Concho, Tex., and Sacramento, Cal., 0.17 in.; Burkes, Arizona, 0.21 in.; Coutoocookville, N. H., 0.30 in.; Prescott, Arizona, 0.33 in.; Umatilla, Or., 0.35 in.; and Campo, Cal., 0.41 inches.

*Floods*.—8th, at Riley, Ill., heavy rains, fields badly flooded, crops injured. 12th, Castroville, Tex., heavy rain storm, streams swollen damaging crops and fences. 19th, New Orleans, heavy rains, streets flooded two feet deep. Cherry Creek, Col., heaviest flood since 1864 caused by heavy rains on the divide at head of Creek, 52 miles south of Denver; all bridges (seven in number) were swept away, lower part of Denver flooded, rail roads damaged and crops and fences washed away. 21st, Denison, Tex., trains delayed by heavy rains for the past three days; track flooded and bridges washed away. 22nd., Deadwood, Dak., freshets, four houses washed away near the placer mines. The Missouri river, at Omaha, on the 25th, overflowed its banks; 26th, portion of B. & M. railroad track partly covered; 27th to 29th, flats covered in all directions; railroad tracks, along river, submerged; Omaha Smelting and Refining Works in positive danger. 29th, in southwestern Iowa, severe thunder-storm, with excessive rain, causing the Nishuabatony river to overflow its banks; bridges almost impassable; the Missouri river, in this section, arose above its banks, destroying crops on the bottom lands. 29th, De Sota, Neb., heavy rains; bridges washed away.

*Droughts.*—Houston, Fla., month very dry, impeding the growth of vegetation.

*High Tides.*—15th, Atlantic City, N. J., severe NE. gale; high tide, sweeping railroad track. 16th, Charleston, unusually high tides. Cape Lookout, very high tide. 30th, Sandy Hook, very high tides, injured jetties.

*Hail.*—2d, Tex. Kan.; 3d, Wy. T., Ohio; 4th, Ohio; 5th, Ohio, N. C., Va.; 6th, N. C.; 7th, Kan., Neb., Ind. T., Tex., Tenn., Ill., Iowa; 8th, Wy. T., Tex., Ill., La., Miss.; 9th, Mich., Pa.; 10th, Col., Wy. T., Minn., Ohio, Mich., Ind., Pa.; 11th, Col., W. Va., Ohio, N. Y., Va., R. I., Conn., Wy. T., Ill., Mass., N. J., Pa., Vt.; 12th, Ind., Neb., N. H., N. Y.; 13th, Mass., Me., N. Y., Vt.; 15th, Col.; 16th, Fla.; 17th, Col., Mo., Neb.; 18th, Col., Tex., Miss., Iowa, Ark., Kan., N. J.; 19th, Kan., Iowa, Mich., Minn., Ill., Ky., Wis.; 20th, W. Va., N. Y., Pa.; 21st, Va., Wy. T., N. J., Pa.; 22d, Neb.; 23d, Minn., Ind. T., Ill., Iowa, Kan.; 24th, Va., Wis.; 25th, N. M., Iowa, Ky., Me., Vt.; 26th, Tex., N. H., Me., N. Y., Vt.; 27th, Me., Vt.; 28th, Kan., Iowa, Mass., Neb.; 29th, Kan.; 30th, Neb., Iowa, Md.; 31st, Fla., Iowa, Mo.

*Rainy Days.*—The number of days on which rain or snow has fallen varies as follows: New England, 6 to 21; Middle Atlantic States, 12 to 17; South Atlantic States, 5 to 13; Gulf States, 5 to 11; Ohio valley and Tennessee, 12 to 18; Lower Lake region, 11 to 19; Upper Lake region, 10 to 18; Upper Mississippi valley, 11 to 21; Lower Missouri valley, 11 to 15; Northwest, 10 to 19; Western Plains, 8 to 15; Rocky Mountains, 6 to 23, and Pacific coast, 3 to 11.

*Cloudy Days.*—For New England, the number varies from 6 to 21; Middle Atlantic States, 5 to 14; South Atlantic States, 2 to 9; Gulf States, 4 to 13; Ohio valley and Tennessee, 3 to 11; Lower Lake region, 7 to 13; Upper Lake region, 7 to 12; Upper Mississippi valley, 7 to 17; Lower Missouri valley, 14 to 16; Northwest, 10 to 21; Western Plains, 13 to 18; Rocky Mountains, 2 to 8, and Pacific coast, 3 to 17.

*Snow fell as follows:* New Hampshire, 12th, 13th; Vermont, 12th, 14th; Massachusetts, 11th, 13th, 14th; Connecticut, 15th; New York, 12th; New Jersey, 11th; Pennsylvania, 11th; Ohio, 10th; Michigan, 4th, 10th to 12th, 14th, 15th; Wisconsin, 4th, 11th; Minnesota, 3rd, 10th; Iowa, 3rd, 11th, 12th; Nebraska, 11th, 12th, 17th; Dakota, 2nd, 3rd, 11th, 12th; Wyoming, 2nd, 6th to 8th, 16th to 19th; and, in Colorado, on Pike's Peak, 1st to 3rd, 6th, 7th, 12th, 14th, 15th, 18th to 21st, 24th, 25th; snow on summit, at end of month, 30 inches, and in gulches 60 feet deep; New Mexico, 17th; Utah, 16th, 17th; Nevada, 12th to 14th, 20th, 21st, 22nd, 28th, 31st.

## RELATIVE HUMIDITY.

The average percentage of relative humidity for the month ranges as follows: New England, 59 to 78; Middle Atlantic States, 60 to 77; South Atlantic States, 59 to 80; East Gulf States, 67 to 75; West Gulf States, 61 to 77; Lower Lake region, 61 to 71; Upper Lake region, 64 to 75; Ohio valley and Tennessee, 58 to 67; Upper Mississippi valley, 57 to 70; Lower Missouri valley, 63 to 65; Red River of the North valley, 59 to 67; Eastern slope, from Dakota to interior of Texas, 45 to 72; Western plateau, 34 to 50; California, 48 to 75. High stations report the following: Mt. Washington, 91; Pike's Peak, 63; Cheyenne, 58; Denver, 47; Santa Fe, 24.

## WINDS.

The prevailing winds at Signal Service stations are shown by arrows, flying with the wind on chart No. II. East of the Mississippi the prevailing direction is westerly; in the Southwest, southerly, and in the Northwest, northwesterly. The maximum velocities have already appeared under the description of storm-areas.

*Total Movements of the Air.*—The following are the *largest* monthly movements as recorded at the Signal Service stations, viz: Pike's Peak, 20,276 miles; Cape Lookout, 11,918; North Platte, 11,055; Cape May, 10,467; Kittyhawk, 10,465; Indianola, 10,454; Breckenridge, 10,134; Dodge City, 10,064; Sandusky, 9,839; Sandy Hook, 9,764; Decatur, 9,742, and Cape Hatteras, 9,741. The total movements is not recorded on Mt. Washington, but velocities exceeding 70 miles per hour occurred on six days. The *smallest* are: Deadwood, Dak., 2,226 miles; Campo, 2,378; Lynchburg, 2,499; Roseburg, 2,759; Visalia, Cal., 2,892; Boerne, Tex., 2,981; Brackettville, Tex., 3,354; Nashville, 3,425; Augusta, 3,450; Los Angeles, 3,459; Shreveport, 3,479; Montgomery, 3,520; Knoxville, 3,770; Springfield, Mass., 3,925.

*Tornadoes*, accompanying storm-area No. XII. The following notes on the severe tornado of the 23rd, in southern Wisconsin, will serve to show the course of the storm. It was probably first noticed by an observer situated in a valley about ten miles west of Mineral Point, who states, "that he saw the cyclone traveling at the rate of about five miles an hour—it seemed to gather strength as it moved—when it struck the hill it shot off in the direction of Mineral Point, and after it had passed him he could hear it roar miles away." Prof. Hinrich's reports, "tornado-cloud observed during p. m., 23d, in Jones Co., Iowa," and states in Iowa Monthly Weather Review, "probably the same which, a few hours later, came down to earth's surface in Wisconsin, near Mineral Point." The storm entered Mineral Point, Iowa Co., from the SW., and passed along a ridge of ground extending over  $\frac{1}{2}$  of a mile in width; it then struck a two-story frame house, containing 13 rooms, completely demolished it, and carried one of the inmates 400 feet in the air, and then dashed her to the ground dead; a rafter from this house was found one mile distant, driven over five feet in the ground. A large barn 300 feet NW. of this house was also demolished, and carried in an opposite direction to the passage of the cy-